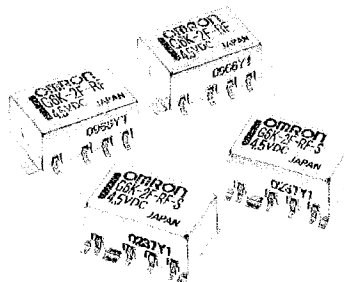


## Surface-mounting High-frequency Relay

G6K(U)-2F-RF(-S)

### Surface-mounting, 1-GHz-Band, Miniature, DPDT, High-frequency Relay

- Superior high-frequency characteristics (at 1 GHz), such as an isolation of 20 dB min. between contacts of the same polarity or 30 dB min. between contacts of different polarity with an insertion loss of 0.2 dB max.
- Miniaturized to 10.3 × 6.9 × 5.4 mm (L × W × H).
- Rated power consumption of 100 mW with high sensitivity.
- Single-side stable and single-winding latching models available.
- Models with a smaller footprint (G6K(U)-2F-RF(-S)) are available to help save space.



RoHS Compliant

## Ordering Information

### Model Number Legend:

G6K□-□□-□□-□□  
1 2 3 4 5

- |   |   |  |
|---|---|--|
| <p><b>1. Relay Function</b><br/>None: Single-side stable<br/>U: Single-winding latching</p> <p><b>2. Contact Form</b><br/>2: DPDT</p> | <p><b>3. Terminal Shape</b><br/>F: Surface-mounting terminals</p> <p><b>4. Special Function</b><br/>RF: High-frequency compatible</p> | <p><b>5. Ground Terminal Shape</b><br/>None: Standard<br/>S: Small footprint</p> |
|---|---|--|

### List of Models

#### Standard Models with Surface-mounting Terminals

Classification	Structure	Contact form	Rated coil voltage	Model	Minimum quantity packaged (See note.)
Single-side stable	Plastic sealed	DPDT	3, 4.5, 5, 12, and 24 VDC	G6K-2F-RF(-S)	300 Units/tray
Single-winding latching			3, 4.5, 5, 12, and 24 VDC	G6KU-2F-RF(-S)	300 Units/reel

**Note:** When ordering Relays in tape packing, add "-TR03" or "-TR09" to the end of the model number. If "-TR" is not added, the Relays will be provided in tray packing.

Relays per reel: 300 for "-TR03"  
900 for "-TR09"

This specification, however, is not part of the relay model number, so it is not marked on the relay case.

## Application Examples

- Measurement equipment
- Communications equipment
- Broadcasting and audio-visual equipment
- Medical equipment

# Specifications

## ■ Contact Ratings

Load	Resistive load
Rated load	125 VAC, 0.3 A 30 VDC, 1 A 1 GHz, 1 W (See note.)
Rated carry current	1 A
Max. switching voltage	125 VAC or 60 VDC
Max. switching current	1 A

Note: This value is for a V.SWR of 1.2 max. at the load.

## ■ High-frequency Characteristics (See note 3.)

Item	Frequency	1 GHz
Isolation	Between contacts of the same polarity	20 dB min.
	Between contacts of different polarity	30 dB min.
Insertion loss		0.2 dB max.
V.SWR		1.2 max.
Maximum carry power		3 W (See note 4.)
Maximum switching power		1 W (See note 4.)

- Note:
1. The impedance of the measurement system is 50 Ω.
  2. The above values are initial values.
  3. Contact your OMRON representative if the Relay will be used in applications that require high repeatability with high-frequency characteristics in microload regions.
  4. These values are for a V.SWR of 1.2 max. at the load.

## ■ Characteristics

Item	Single-side stable models	Single-winding latching models
	G6K-2F-RF(-S)	G6KU-2F-RF(-S)
Contact resistance (See note 2.)	100 mΩ max.	
Operating (set) time (See note 3.)	3 ms max. (approx. 1.4 ms)	3 ms max. (approx. 1.2 ms)
Release (reset) time (See note 3.)	3 ms max. (approx. 1.3 ms)	3 ms max. (approx. 1.2 ms)
Minimum set/reset pulse time	---	10 ms
Insulation resistance (See note 4.)	1,000 MΩ min. (at 500 VDC)	
Dielectric strength	Between coil and contacts	750 VAC, 50/60 Hz for 1 min
	Between contacts of different polarity	750 VAC, 50/60 Hz for 1 min
	Between contacts of the same polarity	750 VAC, 50/60 Hz for 1 min
	Between ground and coil/contacts	500 VAC, 50/60 Hz for 1 min
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 2.5-mm single amplitude (5-mm double amplitude) and 55 to 500 to 55 Hz, 300 m/s <sup>2</sup> Malfunction: 10 to 55 to 10 Hz, 1.65-mm single amplitude (3.3-mm double amplitude) and 55 to 500 to 55 Hz, 200 m/s <sup>2</sup>	
Shock resistance	Destruction: 1,000 m/s <sup>2</sup> Malfunction: 750 m/s <sup>2</sup>	
Endurance	Mechanical: 50,000,000 operations min. (at a switching frequency of 36,000 operations/hour) Electrical: 100,000 operations min. (at a switching frequency of 1,800 operations/hour)	
Ambient temperature	Operating: -40°C to 70°C (with no icing or condensation)	
Ambient humidity	Operating: 5% to 85%	
Weight	Approx. 0.95 g	

- Note:
1. The above values are initial values.
  2. The contact resistance was measured with 10 mA at 1 VDC with a voltage drop method.
  3. Values in parentheses are actual values.
  4. The insulation resistance was measured with a 500-VDC megohmmeter applied to the same parts as those used for checking the dielectric strength.

## ■ Coil Ratings

### Single-side Stable Models

#### G6K-2F-RF(-S)

Rated voltage (VDC)	3	4.5	5	12	24
Rated current (mA)	33.0	23.2	21.1	9.1	4.6
Coil resistance (Ω)	91	194	237	1,315	5,220
Must operate voltage (V)	80% max. of rated voltage				
Must release voltage (V)	10% min. of rated voltage				
Maximum voltage (V)	150% of rated voltage				
Power consumption (mW)	Approx. 100 mW				

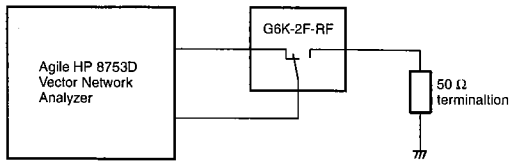
### Single-winding Latching Models

#### G6KU-2F-RF(-S)

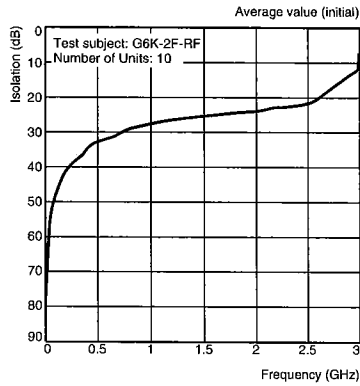
Rated voltage (VDC)	3	4.5	5	12	24
Rated current (mA)	33.0	23.2	21.1	9.1	4.6
Coil resistance (Ω)	91	194	237	1,315	5,220
Must operate voltage (V)	75% max. of rated voltage				
Must release voltage (V)	75% max. of rated voltage				
Maximum voltage (V)	150% of rated voltage				
Power consumption (mW)	Approx. 100 mW				

- Note:
1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.
  2. The operating characteristics are measured at a coil temperature of 23°C.
  3. The maximum voltage is the highest voltage that can be imposed on the Relay coil instantaneously.

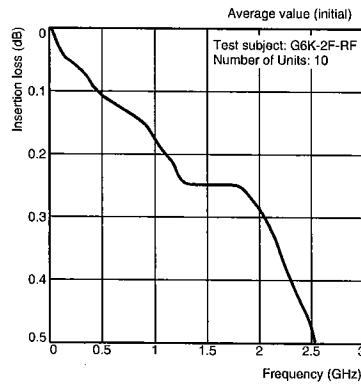
## Engineering Data

High-frequency Characteristics  
(Isolation)

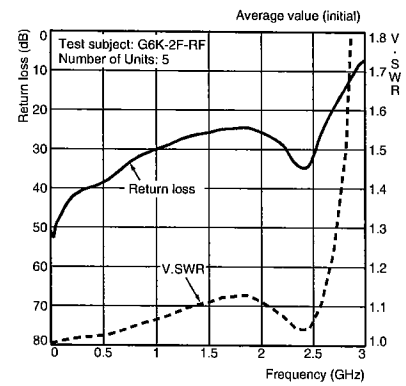
G6K-2F-RF

High-frequency Characteristics  
(Insertion Loss)

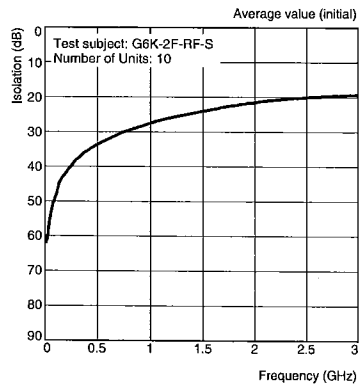
G6K-2F-RF

High-frequency Characteristics  
(Return Loss, V.SWR)

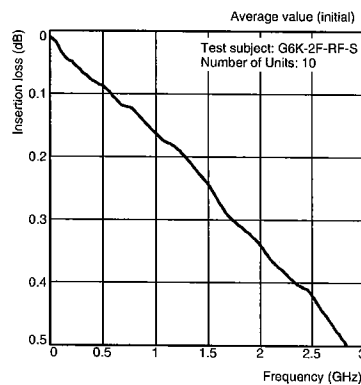
G6K-2F-RF



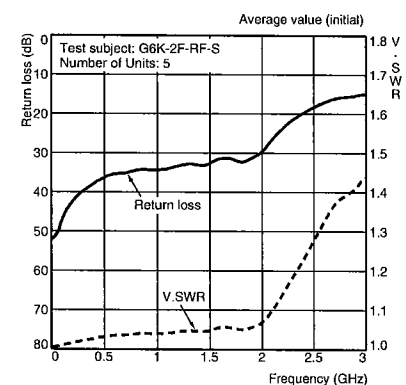
G6K-2F-RF-S



G6K-2F-RF-S



G6K-2F-RF-S

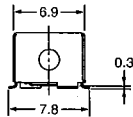
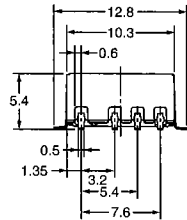
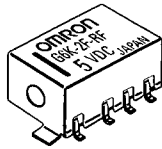


- Note:**
1. Refer to the G6K specifications for basic specifications not shown above.
  2. Ambient temperature condition: 23°C
  3. The high-frequency characteristics depend on the mounting board. Be sure to check operation including durability in actual equipment before use.

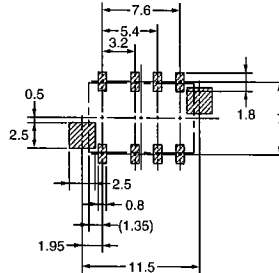
# Dimensions

Note: All units are in millimeters unless otherwise indicated.

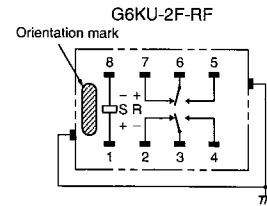
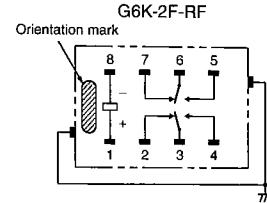
G6K-2F-RF  
G6KU-2F-RF



Mounting Dimensions (Top View)  
Tolerance:  $\pm 0.1$  mm

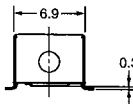
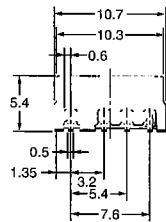
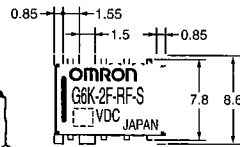
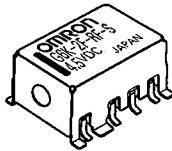


Terminal Arrangement/Internal Connections (Top View)

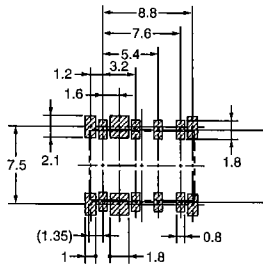


- Note: 1. Each value has a tolerance of  $\pm 0.3$  mm.  
2. The coplanarity of the terminals is 0.15 mm max.

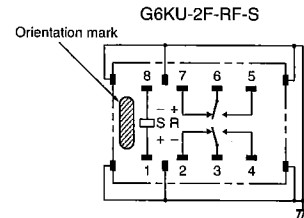
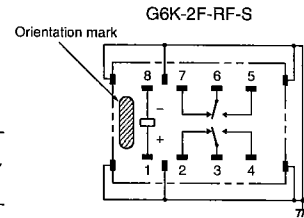
G6K-2F-RF-S  
G6KU-2F-RF-S



Mounting Dimensions (Top View)  
Tolerance:  $\pm 0.1$  mm



Terminal Arrangement/Internal Connections (Top View)

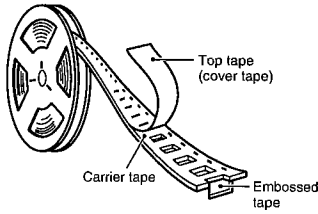


- Note: 1. Each value has a tolerance of  $\pm 0.3$  mm.  
2. The coplanarity of the terminals is 0.15 mm max.

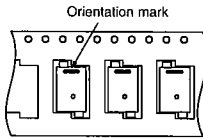
# Tape Packing Specifications (Surface-mounting Terminal Relays)

- Add "-TR03" or "-TR09" to the end of the model number to order Relays in tape packing. If "-TR" is not added, the Relays will be provided in tray packing.
- Relays per reel: 300 for "-TR03"
- 900 for "-TR09"

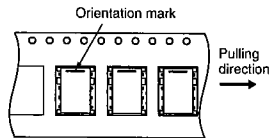
## 1. Direction of Relay Insertion



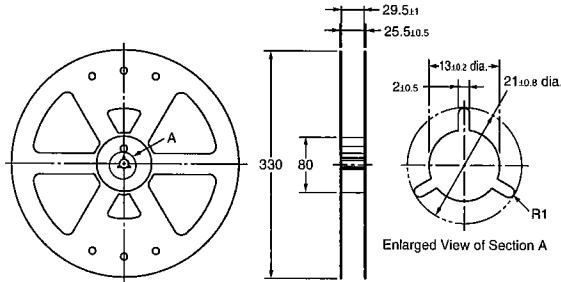
Pulling Direction  
G6K(U)-2F-RF



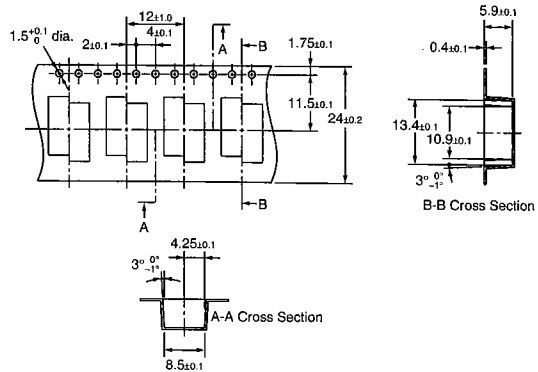
G6K(U)-2F-RF-S



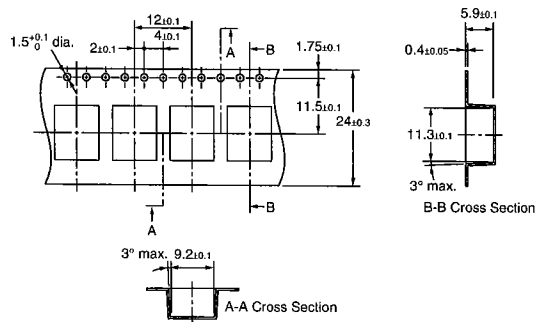
## 2. Reel Dimensions



## 3. Carrier Tape Dimensions G6K(U)-2F-RF



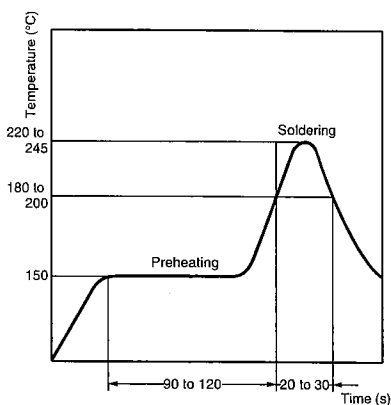
## G6K(U)-2F-RF-S



## Recommended Soldering Method

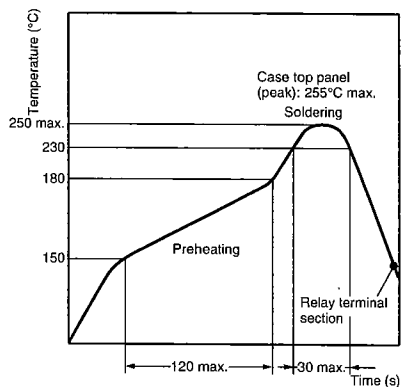
### Recommended Conditions for IRS Method (Surface-mounting Terminals)

#### (1) IRS Method (Mounting Solder: Lead)



**Note:** The temperature profile indicates the temperature on the circuit board surface.

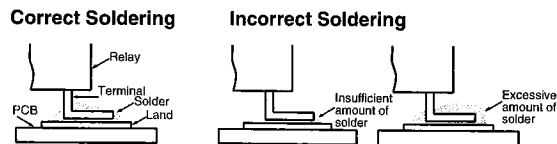
#### (2) IRS Method (Mounting Solder: Lead-free)



**Note:** The temperature profile indicates the temperature on the PCB.

The thickness of cream solder to be applied should be between 200 and 250  $\mu\text{m}$  and the land pattern should be based on OMRON's recommended PCB pattern.

To maintain the correct soldering joint shown in the following diagram, we recommend applying solder with the soldering conditions shown on the left.



Check the soldering in the actual mounting conditions before use.

## Safety Precautions

For general precautions, refer to the *PCB Relays Catalog (X033)*. Familiarize yourself with the precautions and glossary before using the G6K(U)-2F-RF.

### ■ Precautions for Correct Use

#### Relay Handling

Use the Relay as soon as possible after opening the moisture-proof package. If the Relay is left for a long time after opening the moisture-proof package, the appearance may suffer and seal failure may occur after the solder mounting process. To store the Relay after opening the moisture-proof package, place it into the original package and seal the package with adhesive tape.

When washing the product after soldering the Relay to a PCB, use a water-based solvent or alcohol-based solvent and keep the solvent temperature to less than 40°C. Do not put the Relay in a cold cleaning bath immediately after soldering.

#### Environmental Conditions for Usage, Storage, and Transport

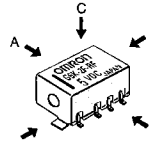
Avoid direct sunlight when using, storing, or transporting the Relay and maintain normal temperature, humidity, and pressure conditions.

#### Long-term, Continuous ON Contacts

Using the Relay in a circuit where the Relay will be ON continuously for long periods (rather than switching) can lead to unstable contacts because the heat generated by the coil itself will affect the insulation and can cause a film to develop on the contact surfaces. We recommend using a latching relay (magnetic-holding relay) in this kind of circuit. If a single-side stable model must be used in this kind of circuit, we recommend adding fail-safe circuits in case the contact fails or the coil burns out.

#### Claw Securing Force During Automatic Mounting

During automatic insertion of Relays, be sure to set the securing force of each claw to the following so that the Relay's characteristics will be maintained.



Direction A: 1.96 N max.  
Direction B: 4.90 N max.  
Direction C: 1.96 N max.

Secure the claws to the shaded area.  
Do not attach them to the center of the Relay or just one part of the Relay.

#### Coating

Do not use silicone coating to coat the Relay when it is mounted to the PCB. Do not wash the PCB after the Relay is mounted using detergent containing silicone. Otherwise, the detergent may remain on the surface of the Relay.

#### Repeatability

Contact your OMRON representative if the Relay will be used in applications that require high repeatability with high-frequency characteristics in microload regions.

# Omron Electronic Components, LLC

## Terms and Conditions of Sales

### I. GENERAL

- Definitions:** The words used herein are defined as follows.
  - Terms:** These terms and conditions
  - Seller:** Omron Electronic Components LLC and its subsidiaries
  - Buyer:** The buyer of Products, including any end user in section III through VI
  - Products:** Products and/or services of Seller
  - Including:** Including without limitation
- Offer; Acceptance:** These Terms are deemed part of all quotations, acknowledgments, invoices, purchase orders and other documents, whether electronic or in writing, relating to the sale of Products by Seller. Seller hereby objects to any Terms proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
- Distributor:** Any distributor shall inform its customer of the contents after and including section III of these Terms.

### II. SALES

- Prices; Payment:** All prices stated are current, subject to change without notice by Seller. Buyer agrees to pay the price in effect at time of shipment. Payments for Products received are due net 30 days unless otherwise stated in the invoice. Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice.
- Discounts:** Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (a) the invoice is paid according to Seller's payment terms and (b) Buyer has no past due amounts owing to Seller.
- Interest:** Seller, at its option, may charge Buyer 1.5% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
- Orders:** Seller will accept no order less than 200 U.S. dollars net billing.
- Currencies:** If the prices quoted herein are in a currency other than U.S. dollars, Buyer shall make remittance to Seller at the then current exchange rate most favorable to Seller; provided that if remittance is not made when due, Buyer will convert the amount to U.S. dollars at the then current exchange rate most favorable to Seller available during the period between the due date and the date remittance is actually made.
- Governmental Approvals:** Buyer shall be responsible for all costs involved in obtaining any government approvals regarding the importation or sale of the Products.
- Taxes:** All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Seller or required to be collected directly or indirectly by Seller for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Seller.
- Financial:** If the financial position of Buyer at any time becomes unsatisfactory to Seller, Seller reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Seller may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts.
- Cancellation; Etc:** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Seller fully against all costs or expenses arising in connection therewith.
- Force Majeure:** Seller shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
- Shipping; Delivery:** Unless otherwise expressly agreed in writing by Seller:
  - All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Seller), at which point title to and all risk of loss of the Products shall pass from Seller to Buyer, provided that Seller shall retain a security interest in the Products until the full purchase price is paid by Buyer;
  - Delivery and shipping dates are estimates only; and
  - Seller will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
- Claims:** Any claim by Buyer against Seller for shortage or damage to the Products occurring before delivery to the carrier must be presented in detail in writing to Seller within 30 days of receipt of shipment.

### III. PRECAUTIONS

- Suitability:** IT IS THE BUYER'S SOLE RESPONSIBILITY TO ENSURE THAT ANY OMRON PRODUCT IS FIT AND SUFFICIENT FOR USE IN A MOTORIZED VEHICLE APPLICATION. BUYER SHALL BE SOLELY RESPONSIBLE FOR DETERMINING APPROPRIATENESS OF THE PARTICULAR PRODUCT WITH RESPECT TO THE BUYER'S APPLICATION INCLUDING (A) ELECTRICAL OR ELECTRONIC COMPONENTS, (B) CIRCUITS, (C) SYSTEM ASSEMBLIES, (D) END PRODUCT, (E) SYSTEM, (F) MATERIALS OR SUBSTANCES OR (G) OPERATING ENVIRONMENT. Buyer acknowledges that it alone has determined that the Products will meet their requirements of the intended use in all cases. Buyer must know and observe all prohibitions of use applicable to the Product/s.
- Use with Attention:** The followings are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible use of any Product, nor to imply that any use listed may be suitable for any Product:
  - Outdoor use, use involving potential chemical contamination or electrical interference.
  - Use in consumer Products or any use in significant quantities.

(c) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.

(d) Systems, machines, and equipment that could present a risk to life or property.

- Prohibited Use:** NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
- Motorized Vehicle Application:** USE OF ANY PRODUCT/S FOR A MOTORIZED VEHICLE APPLICATION MUST BE EXPRESSLY STATED IN THE SPECIFICATION BY SELLER.
- Programmable Products:** Seller shall not be responsible for the Buyer's programming of a programmable Product.

### IV. WARRANTY AND LIMITATION

- Warranty:** Seller's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Seller (or such other period expressed in writing by Seller). SELLER MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT ALL OTHER WARRANTIES, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS.
- Buyer Remedy:** Seller's sole obligation hereunder shall be to replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product or, at Seller's election, to repay or credit Buyer an amount equal to the purchase price of the Product; provided that there shall be no liability for Seller or its affiliates unless Seller's analysis confirms that the Products were handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Seller before shipment.
- Limitation on Liability:** SELLER AND ITS AFFILIATES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. FURTHER, IN NO EVENT SHALL LIABILITY OF SELLER OR ITS AFFILIATES EXCEED THE INDIVIDUAL PRICE OF THE PRODUCT ON WHICH LIABILITY IS ASSERTED.
- Indemnities:** Buyer shall indemnify and hold harmless Seller, its affiliates and its employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Seller is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products.

### V. INFORMATION; ETC.

- Intellectual Property:** The intellectual property embodied in the Products is the exclusive property of Seller and its affiliates and Buyer shall not attempt to duplicate it in any way without the written permission of Seller. Buyer (at its own expense) shall indemnify and hold harmless Seller and defend or settle any action brought against Seller to the extent that it is based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
- Property; Confidentiality:** Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Seller. All information and materials supplied by Seller to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
- Performance Data:** Performance data is provided as a guide in determining suitability and does not constitute a warranty. It may represent the result of Seller's test conditions, and the users must correlate it to actual application requirements.
- Change In Specifications:** Product specifications and description may be changed at any time based on improvements or other reasons. It is Seller's practice to change part numbers when published ratings or features are changed, or when significant engineering changes are made. However, some specifications of the Product may be changed without any notice.
- Errors And Omissions:** The information on Seller's website or in other documentation has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.
- Export Controls:** Buyer shall comply with all applicable laws, regulations and licenses regarding (a) export of the Products or information provided by Seller; (b) sale of Products to forbidden or other proscribed persons or organizations; (c) disclosure to non-citizens of regulated technology or information.

### VI. MISCELLANEOUS

- Waiver:** No failure or delay by Seller in exercising any right and no course of dealing between Buyer and Seller shall operate as a waiver of rights by Seller.
- Assignment:** Buyer may not assign its rights hereunder without Seller's written consent.
- Law:** These Terms are governed by Illinois law (without regard to conflict of laws). Federal and state courts in Illinois have exclusive jurisdiction for any dispute hereunder.
- Amendment:** These Terms constitute the entire agreement between Buyer and Seller relating to the Products, and no provision may be changed or waived unless in writing signed by the parties.
- Severability:** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision.



Complete "Terms and Conditions of Sale" for product purchase and use are on Omron's website at <http://www.components.omron.com> – under the "About Us" tab, in the Legal Matters section.

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

**OMRON**<sup>®</sup>

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